

WHAT IS CLAIMED IS:

1. A vessel filter comprising a first region and a second region, the filter movable between a collapsed position for delivery to the vessel and an expanded position for placement within the vessel, the first region having a mounting portion for mounting the vessel filter within the vessel and a first filter portion converging to form a first converging region at a first end portion, the first converging region being positioned radially and axially inwardly of an end of the mounting portion, the second region having a transverse dimension decreasing toward a second end portion opposite the first end portion to form a second filter portion at the second end portion on the opposing side of the filter from the first filter portion.
2. The vessel filter of claim 1, wherein the second filter portion converges to a second converging region.
3. The vessel filter of claim 2, wherein the first and second converging regions converge to a tubular region.
4. The vessel filter of claim 1, wherein portions of the filter extending from the first end of the mounting portion to the first converging region angle radially inwardly and toward a center of the filter to direct particles toward the center.
5. The vessel filter of claim 1, wherein the filter comprises a plurality of elongated struts having roughened surfaces to engage the vessel wall to increase retention.
6. The vessel filter of claim 1, wherein the filter comprises a plurality elongated struts having vessel engaging members with pointed ends extending from the elongated struts to engage the vessel wall to increase retention.
7. The vessel filter of claim 1, wherein the filter is composed of shape memory material.

8. The vessel filter of claim 1, wherein the filter includes a plurality of elongated struts extending from the first end portion to the second end portion, the opposing ends of at least one of the elongated struts being out of phase.

9. A vessel filter comprising a first region and a second region, the filter movable between a collapsed position for delivery to the vessel and an expanded position for placement within the vessel, the first region having a mounting portion for mounting the vessel filter within the vessel and a first filter portion converging to form a first converging region at a first end portion, the second region having a transverse dimension decreasing toward a second end portion opposite the first end portion to form a second filter portion at the second end portion on the opposing side of the filter from the first filter portion, the second filter portion having a second converging region.

10. The vessel filter of claim 9, wherein the mounting portion has a substantially uniform transverse dimension, the dimension being greater than the transverse dimension of the second region.

11. The vessel filter of claim 10, further comprising vessel engaging members on the mounting portion to enhance retention of the filter.

12. The vessel filter of claim 9, wherein the vessel filter includes a plurality of elongated members having a first component substantially parallel to a longitudinal axis of the filter and a second component angled with respect to the longitudinal axis.

13. A vessel filter comprising a tubular member having a plurality of cutouts formed therein forming a series of elongated struts and movable between a first insertion configuration and a second deployed configuration, in the second configuration the struts extend substantially longitudinally from a first end portion of the filter to an intermediate portion, the struts further extending from the intermediate portion to a second end portion of the filter at an angle to the longitudinal axis radially inwardly towards the longitudinal

axis of the filter, a first filter portion having a first converging region and the second filter portion having a second converging region and being positioned at the second end portion of the filter.

14. The vessel filter of claim 13, wherein the elongated struts include retention elements to engage the vessel wall to increase retention.

15. The vessel filter of claim 14, wherein the retention elements have pointed members extending integrally from the elongated struts.

16. The vessel filter of claim 13, further comprising a connecting rib extending between adjacent longitudinal struts.

17. The vessel filter of claim 13, wherein end portions of at least one of the elongated struts are out of phase.

18. The vessel filter of claim 13, wherein the portion extending radially inwardly of at least one of the elongated struts has a width greater than a longitudinally extending portion of the strut.

19. The vessel filter of claim 13, wherein at least one of the elongated struts has varying widths along its length.

20. A method of implanting a vessel filter in a patient's body comprising the steps of providing a vessel filter having a mounting section and first and second filtering sections each terminating in a converging end region, the first filtering section spaced axially inwardly from a tangent of the end of the mounting section and the second filtering section spaced axially outwardly from the mounting section further from a center of the filter;

providing a delivery member containing the vessel filter in a collapsed configuration having a first diameter;

inserting the vessel filter in the collapsed configuration adjacent a surgical site so that the first filtering section faces in the direction of blood flow and the second filtering section is downstream of the first filtering section; and

deploying the vessel filter from the delivery member so the vessel filter moves to a placement configuration having a diameter larger than the first diameter and the first filtering section directs particles toward a center of the filter and the second filtering section directs particles bypassing the first filtering section to the center of the filter.

21. The method of claim 20, wherein the vessel filter is composed of shape memory material and movement of the vessel filter to the placement configuration moves the vessel filter towards a memorized configuration.

22. The method of claim 21, further comprising the step of removing the implanted vessel filter from the patient's body.